CLAIMS

- 1 A magnetic media hard disk, comprising: 1. 2 a substrate; 3 a magnetic layer; 4 at least one underlayer being disposed between said substrate and said magnetic layer; an overcoat layer being disposed above said magnetic layer, said overcoat layer being 5 comprised of diamond-like carbon (DLC), and wherein carbon atoms of said DLC layer are 6 generally implanted into said magnetic layer to a depth of less than approximately 10 Å, and 7 8 wherein the density of said overcoat layer is between approximately 2.0 g/cm³ and 9 approximately 2.9 g/cm³. A magnetic disk as described in claim 1 wherein the thickness of said overcoat layer is 2. from approximately 25 Å to approximately 100 Å. A magnetic disk as described in claim 1 wherein the thickness of said overcoat layer is - 1 3. from approximately 25 Å to approximately 60 Å. 2 A magnetic disk as described in claim 1 wherein the thickness of said overcoat layer is 1 4. ..2 approximately 35 Å.
 - 1 5. A magnetic disk as described in claim 1 wherein said overcoat layer includes nitrogen.

- 1 6. A magnetic disk as described in claim 5 wherein said overcoat layer includes nitrogen in
- 2 the range of approximately 2 at. % to approximately 20 at. %.
- 1 7. A hard disk drive, comprising:
- 2 at least one magnetic media hard disk being adapted for rotary motion upon a disk drive
- 3 motor spindle;
- 4 at least one slider device having a slider body portion being adapted to fly over said
- 5 magnetic media hard disk;
- a magnetic head being formed on said slider body for writing data to said magnetic media
- 7 hard disk and reading data from said magnetic media hard disk;
- said magnetic media hard disk, including:
 - 9 a substrate;
 - 0 a magnetic layer;
 - at least one underlayer being disposed between said substrate and said magnetic layer;
 - an overcoat layer being disposed above said magnetic layer, said overcoat layer being
- comprised of diamond-like carbon (DLC), and wherein carbon atoms of said DLC layer are
- 14 generally implanted into said magnetic layer to a depth of less than approximately 10 Å, and
- 15 wherein the density of said overcoat layer is between approximately 2.0 g/cm³ and
- approximately 2.9 g/cm³.
- 1 8. A hard disk drive as described in claim 7 wherein the thickness of said overcoat layer is
- 2 from approximately 25 Å to approximately 100 Å.

- 1 9. A hard disk drive as described in claim 7 wherein the thickness of said overcoat layer is
- 2 from approximately 25 Å to approximately 60 Å.
- 1 10. A hard disk drive as described in claim 7 wherein the thickness of said overcoat layer is
- 2 approximately 35 Å.
- 1 11. A hard disk drive as described in claim 7 wherein said overcoat layer includes nitrogen.
- 1 12. A hard disk drive as described in claim 11 wherein said overcoat layer includes nitrogen
- 2 in the range of approximately 2 at. % to approximately 20 at. %.
- 13. A process for fabricating a magnetic media hard disk comprising the steps of:
- fabricating a magnetic media layer upon a surface material of a substrate;
- fabricating a diamond-like carbon (DLC) layer upon said magnetic layer, including the
 - steps of:

- fabricating an initial thickness DLC layer portion upon said magnetic layer
- 6 utilizing a relatively low ion carbon beam energy;
- fabricating a subsequent thickness DLC layer portion upon said initial thickness
- 8 DLC layer portion utilizing a relatively high carbon ion beam energy.
- 1 14. A process for fabricating a magnetic media hard disk as described in claim 13 wherein
- 2 said relatively low carbon ion beam energy is approximately 10 eV to approximately 20 eV.

- 1 15. A process for fabricating a magnetic media hard disk as described in claim 14 wherein
- 2 said relatively high ion beam energy is approximately 100 eV.
- 1 16. A process for fabricating a magnetic media hard disk as described in claim 13, including
- the further step of fabricating an intermediate thickness DLC layer portion between said initial 2
- 3 DLC layer portion and said subsequent DLC layer portion, wherein said intermediate thickness
- 4 DLC layer portion is fabricated utilizing a relatively mid-range carbon ion beam energy between
- 5 said relatively low carbon ion beam energy and said relatively high carbon ion beam energy.
- 11 A process for fabricating a magnetic media hard disk as described in claim 16 wherein 17.
 - said intermediate carbon ion beam energy is approximately 50 eV.
- 2 mm au 1 A process for fabricating a magnetic media hard disk as described in claim 17 wherein 18.
 - said DLC layer has a thickness of approximately 10 Å following the deposition of said initial
 - thickness DLC layer portion, and said DLC layer has a thickness of approximately 19 Å
 - following the deposition of said intermediate thickness DLC layer portion, and said DLC layer
 - 5 has a final thickness of approximately 25 Å following the deposition of said subsequent
 - 6 thickness DLC layer portion.
 - A method for fabricating a magnetic media hard disk as described in claim 18 wherein 1 19.
 - said DLC layer is formed with a density of approximately 2.0 g/cm³ to approximately 2.9 g/cm³. 2

- 1 20. A method for fabricating a magnetic media hard disk as described in claim 13 wherein
- 2 nitrogen ion species are deposited within said subsequent thickness DLC layer portion.
- 21. A process for fabricating a magnetic media hard disk as described in claim 20 wherein 1
- said nitrogen species are deposited in a range of approximately 2 at. % to approximately 20 at. 2
- 3 %.
- 22. A method for fabricating a magnetic media hard disk comprising the steps of: 1
- 2 fabricating a magnetic material layer upon a material surface of a substrate;
- fabricating a diamond-like carbon (DLC) layer upon said magnetic layer, wherein said **3**
 - DLC layer is fabricated in the steps of:
 - depositing carbon ion species upon said magnetic layer utilizing a relatively low
 - carbon ion beam energy of from approximately 10 eV to approximately 20 eV, to deposit an
- 4 5 6 7 8 initial DLC layer thickness;
 - subsequently increasing the carbon ion beam energy level as the thickness of said
 - DLC layer increases due to deposition of carbon ion species within said DLC layer, such that
 - 10 higher energy carbon ion beam species become implanted within said DLC layer thickness.
 - A method for fabricating a magnetic media disk as described in claim 22 wherein said 1 23.
 - 2 carbon ion beam energy level is varied smoothly with time.
 - 1 24. A method for fabricating a magnetic media hard disk as described in claim 22 wherein
 - 2 said carbon ion beam energy level varies as a step function with time.

- 1 25. A method for fabricating a magnetic media hard disk as described in claim 23 wherein
- 2 nitrogen ion species are implanted within said DLC layer thickness.
- 1 26. A method for fabricating a magnetic media hard disk as described in claim 25 wherein
- 2 said nitrogen ion species are included within said DLC layer in a range of approximately 2 at. %
- 3 to approximately 20 at. %.